

CTC Laboratories, Inc.

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	TEST REPORT			
Report No	CTC20211259E02			
FCC ID:	2AYD5-I21M01			
Applicant:	Imin Technology Pte Ltd			
Address······	11 Bishan Street 21, #03-05 Bosch Bu	ilding, Singapore 573943		
Manufacturer	Imin Technology Pte Ltd			
Address	11 Bishan Street 21, #03-05 Bosch Bu	ilding, Singapore 573943		
Product Name·····:	Mobile POS			
Trade Mark······:	iMin			
Model/Type reference······:	I21M01			
Listed Model(s) ·····:	N/A			
Standard:	FCC CFR Title 47 Part 15 Subpart C	Section 15.247		
Date of receipt of test sample:	Sep. 10, 2021			
Date of testing	Sep. 11, 2021 ~ Oct. 21, 2021			
Date of issue:	Oct. 22, 2021			
Result:	PASS			
Compiled by:				
(Printed name+signature)	Terry Su	Perry Ju		
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(Printed name+signature)	Miller Ma	Tenny Su Miller Ma Jamas		
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Testing Laboratory Name:	CTC Laboratories, Inc.			
Address	1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China			
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report is received. It will not be taken into consideration beyond this limit. The test report merely

correspond to the test sample.



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1.1. Test Standards

The tests were performed according to following standards:

<u>FCC Rules Part 15.247</u>: Operation within the bands of 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz. <u>RSS 247 Issue 2</u>: Standard Specifications for Frequency Hopping Systems (FHSs) and Digital Transmission Systems (DTSs) Operating in the Bands 902-928MHz, 2400-2483.5MHz and 5725-5850MHz. <u>ANSI C63.10-2013</u>: American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report version

Revised No.	Date of issue	Description
01	Oct. 22, 2021	Original



1.3. Test Description

FCC Part 15 Subpart C (15.247) / RSS 247 Issue 2					
Test Item	Standard Section		Result	Test Engineer	
rest item	FCC	FCC IC			
Antenna Requirement	15.203	/	Pass	Alicia Liu	
Conducted Emission	15.207	RSS-Gen 8.8	Pass	Ice Lu	
Conducted Band Edge and Spurious Emissions	15.247(d)	RSS 247 5.5	Pass	Alicia Liu	
Radiated Band Edge and Spurious Emissions	15.205&15.209& 15.247(d)	RSS 247 5.5	Pass	Alicia Liu	
6dB Bandwidth	15.247(a)(2)	RSS 247 5.2 (a)	Pass	Alicia Liu	
Conducted Max Output Power	15.247(b)(3)	RSS 247 5.4 (d)	Pass	Alicia Liu	
Power Spectral Density	15.247(e)	RSS 247 5.2 (b)	Pass	Alicia Liu	
Transmitter Radiated Spurious	15.209&15.247(d)	RSS 247 5.5& RSS-Gen 8.9	Pass	Alicia Liu	

Note: The measurement uncertainty is not included in the test result.





CTC Laboratories, Inc.

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5365

CTC Laboratories, Inc. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation. Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 4340.01

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for r the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

FCC (Registration No.: 951311, Designation Number CN1208)

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained inour files. Registration 951311, Aug 26, 2017.

1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Below is the best measurement capability for CTC Laboratories, Inc.



Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.08 dB	(1)
Radiated Emissions 30~1000MHz	4.51 dB	(1)
Radiated Emissions 1~18GHz	5.84 dB	(1)
Radiated Emissions 18~40GHz	6.12 dB	(1)
Occupied Bandwidth		(1)

Note (1): This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

1.6. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	21°C ~ 27°C
Relative Humidity:	40% ~ 60%
Air Pressure:	101kPa



2. GENERAL INFORMATION

2.1. Client Information

Applicant:	Imin Technology Pte Ltd	
Address:	11 Bishan Street 21, #03-05 Bosch Building, Singapore 573943	
Manufacturer:	Imin Technology Pte Ltd	
Address:	11 Bishan Street 21, #03-05 Bosch Building, Singapore 573943	

2.2. General Description of EUT

Product Name:	Mobile POS	
Trade Mark:	iMin	
Model/Type reference:	I21M01	
Listed Model(s):	N/A	
Power supply:	5Vdc/2A from AC/DC Adapter 7.4Vdc from 2600mAh Li-ion Battery	
Adapter model:	TPA-46050200UU Input:100-240V~ 50/60Hz 0.3A Output: 5Vdc/2A	
Hardware version:	Z2PRO_MB_UM512_V2.0	
Software version:	Neostra_Z2Pro_testinage_003_20210714	
BT 5.0/ BLE Support 1M PHY, 2M	PHY, Code PHY(S=2, S=8)	
Modulation:	GFSK	
Operation frequency:	2402MHz~2480MHz	
Channel number:	40	
Channel separation:	2MHz	
Antenna type:	FPC Antenna	
Antenna gain:	1.67dBi	



FN

2.3. Accessory Equipment information

Equipment Information						
Name	Model	S/N	Manufacturer			
1	1	1	1			
1	1	1	1			
Cable Information	Cable Information					
Name	Shielded Type	Ferrite Core	Length			
1	1	1	1			
Test Software Information						
Name	Versions	1	1			
Engineering mode	1	1	1			



2.4. Operation state

Operation Frequency List: The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. BT BLE, 40 channels are provided to the EUT. Channels 00/19/39 were selected for testing. Operation Frequency List:

Channel	Frequency (MHz)		
00	2402		
01	2404		
:	÷		
18	2438		
19	2440		
20	2442		
:	:		
38	2478		
39	2480		

Note: The display in grey were the channel selected for testing.

Test mode

For RF test items:

The engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions:

The EUT was set to connect with the Bluetooth instrument under large package sizes transmission.

For Radiated spurious emissions test item:

The engineering test program was provided and enabled to make EUT continuous transmit. The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.



2.5. Measurement Instruments List

Tonsce	Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until	
1	Spectrum Analyzer	Rohde & Schwarz	FSU26	100105	Dec. 25, 2021	
2	Spectrum Analyzer	Rohde & Schwarz	FUV40-N	101331	Mar. 15, 2022	
3	MXG Vector Signal Generator	Agilent	N5182A	MY47420864	Dec. 25, 2021	
4	Signal Generator	Agilent	E8257D	MY46521908	Dec. 25, 2021	
5	Power Sensor	Agilent	U2021XA	MY5365004	Mar. 15, 2022	
6	Power Sensor	Agilent	U2021XA	MY5365006	Mar. 15, 2022	
7	High and low temperature box	ESPEC	MT3035	N/A	Mar. 24, 2022	
8	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	102414	Dec. 25, 2021	
9	300328 v2.2.2 test system	TONSCEND	v2.6	/	/	

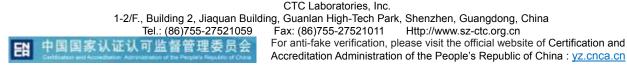
Radiat	Radiated emission(3m chamber 2)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated Until	
1	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-1013	Jan.12, 2022	
2	Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-647	Dec. 24, 2021	
3	Spectrum Analyzer	R&S	FSU26	100105	Dec. 25, 2021	
4	Spectrum Analyzer	R&S	FSV40-N	101331	Mar. 15, 2022	
5	Pre-Amplifier	SONOMA	310	186194	Dec. 25, 2021	
6	Low Noise Pre-Amplifier	EMCI	EMC051835	980075	Dec. 25, 2021	
7	Test Receiver	R&S	ESCI7	100967	Dec. 25, 2021	

Radiated emission(3m chamber 3) Manufacturer Calibrated Until Item Test Equipment Model No. Serial No. 1 Trilog-Broadband Antenna Schwarzbeck **VULB 9168** 9168-759 Nov.09, 2021 2 Horn Antenna Schwarzbeck **BBHA 9120D** 9120D-647 Dec. 24, 2021 3 **Test Receiver** MY56400071 Dec. 25, 2021 Keysight N9038A 4 **Broadband Premplifier** SCHWARZBECK BBV9743B 259 Dec. 25, 2021 Mirowave Broadband 5 SCHWARZBECK BBV9718C 111 Dec. 25, 2021 Amplifier

Condu	cted Emission				
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 25, 2021
2	LISN	R&S	ENV216	101113	Dec. 25, 2021
3	EMI Test Receiver	R&S	ESCS30	100353	Dec. 25, 2021

Note:1. The Cal. Interval was one year.

2. The cable loss has calculated in test result which connection between each test instruments.





3. TEST ITEM AND RESULTS

3.1. Conducted Emission

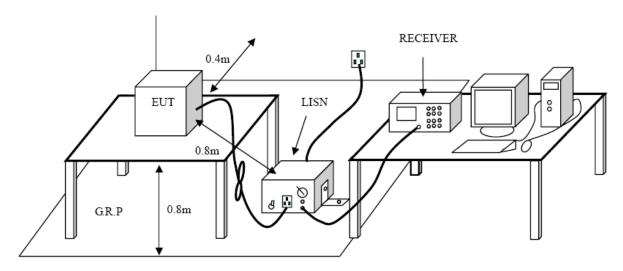
<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.207/ RSS - Gen 8.8

Eroquonov rongo (MHz)	Limit (d	BuV)
Frequency range (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Configuration



Test Procedure

1. The EUT was setup according to ANSI C63.10:2013 requirements.

2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.

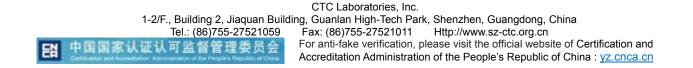
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

7. During the above scans, the emissions were maximized by cable manipulation.

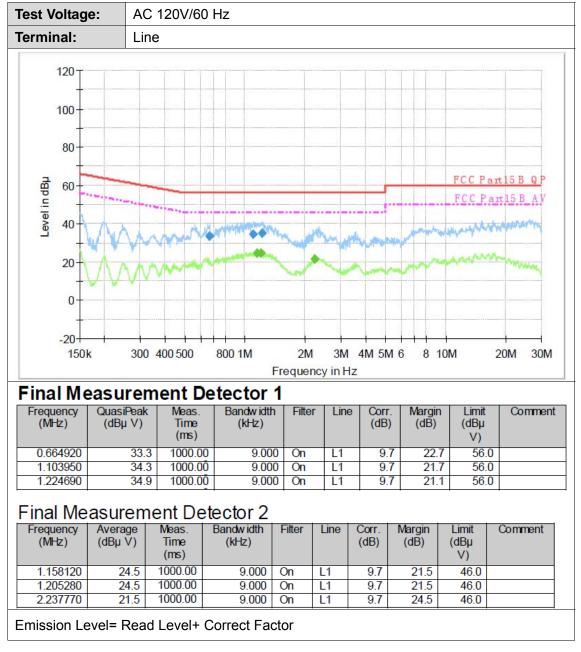




Test Mode:

Please refer to the clause 2.4.

Test Results





est Voltage									
erminal:	Ne	eutral							
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100-					0	_			
80-									
료 60 -									<u>rt15BQ</u> P
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20-									
0									
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0				Frequenc			16 8 1	H DM	20M 30M
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0		ment C	Detector	Frequenc 1	cy in Hz	z	. Margin	0M Limit (dBµ	20M 30M
0 -20 150k Final Me Frequency	easure QuasiPeal	ment C	Detector Bandwidt	Frequenc 1	cy in Hz	z Corr	. Margin	Limit	
0 -20 150k Final Me Frequency (MHz) 0.150600	QuasiPeal (dBµ V)	Meas. Time (ms)	Detector Bandwidt (kHz) 00 9.00	Frequence 1 h Filter 00 On	Line	z Corr. (dB)	. Margin (dB)	Limit (dBµ V) 0 66.0	Commen
0 -20 150k Final Me Frequency (MHz) 0.150600 0.592230	QuasiPeak (dBµ V) 43. 37.	Meant C K Meas. Time (ms) 1 1 1000.0 3 1000.0	Detector Bandwidt (kHz) 00 9.00 00 9.00	Frequence 1 h Filter 00 On 00 On	Line	z Corr. (dB) 10.0	. Margin (dB) 0 22.9 0 18.7	Limit (dBµ V) 0 66.0 7 56.0	Commen
0 -20 150k Frequency (MHz) 0.150600 0.592230 1.195700	easure QuasiPeal (dBµ V) 43. 37. 34.	Meas. Time (ms) 1 1000.0 3 1000.0 9 1000.0	Detector Bandwidt (kHz) 00 9.00 00 9.00 00 9.00	Frequence 1 h Filter 00 On 00 On	Line	z Corr. (dB)	. Margin (dB) 0 22.9 0 18.7	Limit (dBµ V) 0 66.0 7 56.0	Commen
0 -20 150k Final Me Frequency (MHz) 0.150600 0.592230 1.195700	easure QuasiPeal (dBµ V) 43. 37. 34.	Meas. Time (ms) 1 1000.0 3 1000.0 9 1000.0	Detector Bandwidt (kHz) 00 9.00 00 9.00 00 9.00	Frequence 1 h Filter 00 On 00 On	Line	z Corr. (dB) 10.0	. Margin (dB) 0 22.9 0 18.7	Limit (dBµ V) 0 66.0 7 56.0	Commen
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0 -20 150k Final Me Frequency (MHz) 0.150600 0.592230 1.195700 Final Me Frequency (MHz)	QuasiPeak (dBµ V) 43. 37. 34. asuren Average (dBµ V)	ment C Meas. Time (ms) 1 1000.0 3 1000.0 9 1000.0 nent De Meas. Time (ms)	Detector Bandw idt (kHz) 00 9.00 <td< td=""><td>Frequence 1 h Filter 00 On 00 On 00 On 10 On 10 On 10 On</td><td>Line</td><td>z Corr. (dB) Corr. (dB)</td><td>Margin (dB) 22.9 0 18.7 0 21.2 Margin (dB)</td><td>Limit (dBµ V) 0 66.0 7 56.0 2 56.0 Limit (dBµ V)</td><td>Commen</td></td<>	Frequence 1 h Filter 00 On 00 On 00 On 10 On 10 On 10 On	Line	z Corr. (dB) Corr. (dB)	Margin (dB) 22.9 0 18.7 0 21.2 Margin (dB)	Limit (dBµ V) 0 66.0 7 56.0 2 56.0 Limit (dBµ V)	Commen
0 -20 150k Final Me Frequency (MHz) 0.150600 0.592230 1.195700 Final Me Frequency (MHz) 0.582850	easure QuasiPeak (dBµ V) 43. 37. 34. asuren Average (dBµ V) 31.2	ment C Meas. Time (ms) 1 1000.0 3 1000.0 9 1000.0 nent De Meas. Time (ms) 1000.00	Detector Bandwidt (kHz) 00 9.00 00 9.00 00 9.00 00 9.00 00 9.00 etector 2 Bandwidth (kHz) 9.000	Frequence 1 h Filter 00 On 00 On 00 On 10 On 11 10 10 10 10 10 10 10 10 10	Line Line N Line N	z Corr. (dB) 10.0 10.0 (dB) 10.0	Margin (dB) 22.9 0 18.7 0 21.2 Margin (dB) 14.8	Limit (dBµ V) 0 66.0 7 56.0 2 56.0 Limit (dBµ V) 46.0	Commen
0 -20 150k Final Me Frequency (MHz) 0.150600 0.592230 1.195700 Final Me Frequency (MHz)	QuasiPeak (dBµ V) 43. 37. 34. asuren Average (dBµ V)	ment C Meas. Time (ms) 1 1000.0 3 1000.0 9 1000.0 nent De Meas. Time (ms)	Detector Bandw idt (kHz) 00 9.00 <td< td=""><td>Frequence 1 h Filter 00 On 00 On 00 On 10 On 10 On 10 On</td><td>Line</td><td>z Corr. (dB) Corr. (dB)</td><td>Margin (dB) 22.9 0 18.7 0 21.2 Margin (dB)</td><td>Limit (dBµ V) 0 66.0 7 56.0 2 56.0 Limit (dBµ V)</td><td>Commen</td></td<>	Frequence 1 h Filter 00 On 00 On 00 On 10 On 10 On 10 On	Line	z Corr. (dB) Corr. (dB)	Margin (dB) 22.9 0 18.7 0 21.2 Margin (dB)	Limit (dBµ V) 0 66.0 7 56.0 2 56.0 Limit (dBµ V)	Commen



3.2. Radiated Emission

<u>Limit</u>

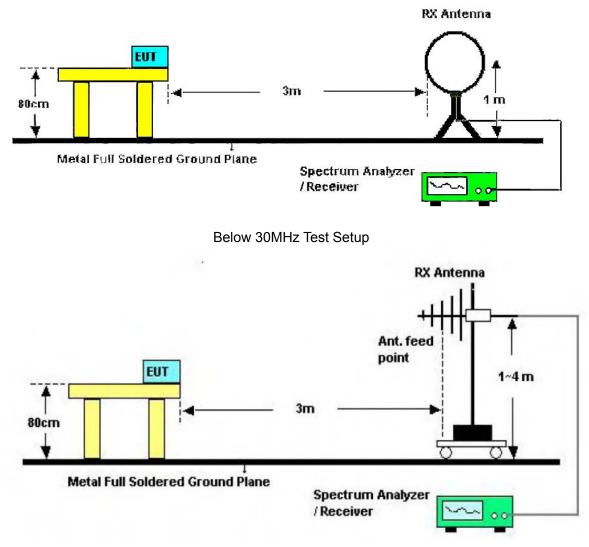
FCC CFR Title 47 Part 15 Subpart C Section 15.209/ RSS – Gen 8.9

Frequency	Limit (dBuV/m @3m)	Value
30 MHz ~ 88 MHz	40.00	Quasi-peak
88 MHz ~ 216 MHz	43.50	Quasi-peak
216 MHz ~ 960 MHz	46.00	Quasi-peak
960 MHz ~ 1 GHz	54.00	Quasi-peak
	54.00	Average
Above 1 GHz	74.00	Peak

Note:

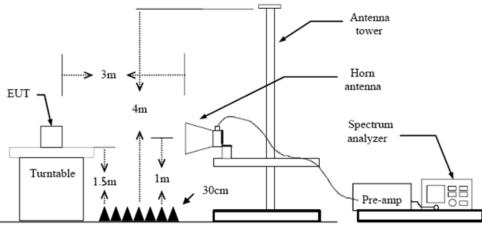
- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

Test Configuration



Below 1000MHz Test Setup





Above 1GHz Test Setup

Test Procedure

1. The EUT was setup and tested according to ANSI C63.10:2013

2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for

above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable 3. height antenna tower.

4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.

Set to the maximum power setting and enable the EUT transmit continuously. 5.

Use the following spectrum analyzer settings 6.

(1) Span shall wide enough to fully capture the emission being measured;

(2) Below 1 GHz:

RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;

If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

(3) From 1 GHz to 10^{th} harmonic:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW≥1/T Peak detector for Average value.

Note 1: For the 1/T& Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.

Test Result

9 KHz~30 MHz

From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



nt. Po	Ι.	Hori	izontal					
est Mo	ode:	TX [·]	1MHz Mo	de 2402MHz				
emark		Only	y worse c	ase is reporte	d			
.0 dBu\	∀/m							
							0.00.400011	
						FCC Part15 RE-Clas Margin -6 dB	s C 30-1000M	
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			administration and a					
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		60.00	and an and a second	(MHz)		0.00		1000.0
,		60.00 NCY	Readin (dBuV)	(мн _{z)} g Factor		Limit	Margin (dB)	
30.000	Frequer	60.00 ncy)	Readin	(мн _{z)} g Factor	Level	Limit	Margin	1000.0
30.000 No.	Frequer (MHz	60.00 ncy)	Readin (dBuV)	(мн _{z)} g Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	1000.0
No.	Frequer (MHz 59.100	60.00 ncy) 00 66	Readin (dBuV) 32.31	(мн₂) g Factor (dB/m) -15.57	300 Level (dBuV/m) 16.74	0.00 Limit (dBuV/m) 40.00	Margin (dB) -23.26	Detector
No.	Frequer (MHz 59.100 136.370	60.00 ncy) 00 66 00	Readin (dBuV) 32.31 31.80	(мн₂) g Factor (dB/m) -15.57 -15.37	300 Level (dBuV/m) 16.74 16.43	Limit (dBuV/m) 40.00 43.50	Margin (dB) -23.26 -27.07	Detector QP QP
No. 1 2 30.000	Frequer (MHz 59.100 136.370 162.890	60.00 ncy) 00 66 00 33	Readin (dBuV) 32.31 31.80 32.73	(мн₂) g Factor (dB/m) -15.57 -15.37 -14.43	300 Level (dBuV/m) 16.74 16.43 18.30	Limit (dBuV/m) 40.00 43.50 43.50	Margin (dB) -23.26 -27.07 -25.20	Detector QP QP QP

FN

QP

QP

QP

-22.58

-16.46

-11.49



An	t. Po	l.	Vert	ical							
Tes	st Mo	de:	TX [·]	1MHz N	/lode	2402MHz					
Re	mark	:	Only	y worse	cas	e is reported	ł				
90.0	dBu	V/m									
80											
70											
60								FCC Part	15 BF-Clas	s C 30-1000M	
50								Margin -6			
40											6
30										5	A fear and the Strate
20		ı.	2			3	ي ال ال ال	Likemer	www.	wind	
10	1~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mplumm	them	Weny Herender	stylestart	to work and the second	And Man Man Mar	MONT .			
0											
-10											
3	0.000		60.00			(MHz)	30	0.00			1000.000
Ν	No.	Frequer (MHz		Read (dBu	-	Factor (dB/m)	Level (dBuV/m		imit uV/m)	Margin (dB)	Detector
	1	43.580	0	31.0)8	-14.40	16.68	40	0.00	-23.32	QP
	2	69.123	3	32.0)6	-17.48	14.58	40	0.00	-25.42	QP
	3	160.95	00	32.3	35	-14.38	17.97	43	3.50	-25.53	QP

Page 17 of 61

Remarks:

6 *

4

5

439.3400

640.1300

951.8233

33.99

35.25

35.08

1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value

-10.57

-5.71

-0.57

23.42

29.54

34.51

46.00

46.00

46.00



Ant. Po	ol.	Hori	zontal					
Test Mo	ode:	TX E	BLE 1MHz N	/lode 2402N	1Hz			
Remarl	k:		eport for the cribed limit.	e emission v	vhich more t	han 10 dB t	pelow the	9
100.0 dBu	ıV/m							
						FCC Part15 C	- Above 1G F	ж
50						FCC Part15 C	- Above 1G A	W I
50	2 X							
	*							
0.0								
	3500.00 6	000.00	8500.00 110	00.00 13500.0	D 16000.00 1	8500.00 21000	.00	26000.00 MH
No.	Freque (MH:		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4803.8	855	3.11	29.33	32.44	54.00	-21.56	AVG
2	4803.	994	3.11	43.15	46.26	74.00	-27.74	peak
Remark	I (S:		3.11 na Factor (d		46.26	74.00	-27.74	

EN



nt. Po	l	Verti	/ertical TX BLE 1MHz Mode 2402MHz								
est Mo	ode:	TX E	BLE 1MHz N	lode 2402M	lHz						
emark	κ:		eport for the cribed limit.	emission w	hich more t	han 10 dB b	elow the	;			
00.0 dBu	iV/m										
						500 D	AL				
		_				FCC Part15 C	- Above Tu P	ĸ			
						FCC Part15 C	- Above 1G A	v			
50											
	2										
	Î	_									
	1										
	×										
0.0											
1000.000) 3500.00 60	00.00	8500.00 11	000.00 13500.0	D 16000.00 1	8500.00 21000	.00	26000.00 M			
	Freque		Factor	Reading	Level	Limit	Margin				
No.	(MHz	:)	(dB/m)	(dBuV)	(dBuV/m)		(dB)	Detecto			
1	4804.1	04	3.11	12.15	15.26	74.00	-58.74	peak			
2	4804.1	05	3.11	28.13	31.24	54.00	-22.76	AVG			
	•						1				

EN



	I.	Hori	zontal					
est Mo	ode:	TX E	3LE 1MHz N	/lode 2440N	1Hz			
emark	c:		eport for the cribed limit.	emission w	vhich more t	han 10 dB t	pelow the	;
)0.0 dBu	iV/m							
						FCC Part15 C	- Above 1G P	K
50						FCC Part15 C	- Above 1G A	v
00	2	:						
	*	:						
).0								
1000.000	3500.00	6000.00	8500.00 110	000.00 13500.00	0 16000.00 1	8500.00 21000	.00	26000.00 M
1000.000	3300.00	6000.00	8500.00 110	<u>100.00 13300.00</u>	<u>. 16000.00 1</u>	8300.00 21000	.00	<u>26000.00 M</u>
No.	Frequ (Mł		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
No.	(MI							Detecto AVG

EN



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Ant. Po	l.	Verti	ical									
Test Mo		TX E	BLE 1M	Hz M	lode 244	0MF	Ηz					
Remark	K :		eport fo cribed li		emissio	n wł	nich r	nore t	han 10	dB b	pelow th	е
100.0 dB	uV/m											
									FCC F	Part15 C	- Above 1G	РК
50									FCC F	art15 C	- Above 1G	AV
	1 X											
0.0) 3500.00 6	000.00	8500.00	110	00.00 135	00.00	1600)0.00 1	8500.00	21000	00	26000.00 MH
No.	Freque (MHz	:)	Facto (dB/n	n)	Readin (dBuV) (dBu	vel V/m)	Lin (dBu\	//m)	Margir (dB)	Delector
1	4879.7	769	3.33	3	41.19		44.	.52	74.	00	-29.48	3 peak
2	4879.8	399	3.33	3	28.07		31.	.40	54.	00	-22.60	AVG
Remark	1	555	0.0	,	20.07		51.	.40	54.	00	-22.00	7 200



Ant. P	ol.	Hori	zontal					
lest N	lode:	TX E	BLE 1MHz N	/lode 2480N	lHz			
Rema	rk:		eport for the cribed limit.	emission w	hich more t	han 10 dB b	elow the	•
100.0 d	Bu¥/m							
						FCC Part15 C	- Above 16 Pl	×
							- ADOVE TO FI	<u>`</u>
						FCC Part15 C	- Above 1G A	v
50	2	2						
	á							
		•						
0.0								
	00 3500.00	6000.00	8500.00 110	000.00 13500.00) 16000.00 1	8500.00 21000.	.00	26000.00 M
No.	Frequ (Mł		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
1	4959	.866	3.57	42.97	46.54	74.00	-27.46	peak
2	4960	.069	3.57	27.92	31.49	54.00	-22.51	AVG
1	4959 4960	.866	3.57	42.97	46.54	74.00	-27.46	pe

FN



Ant. Po	ol.	Vert	ical					
est M	ode:	TX I	BLE 1MHz	Mode 2480N	/Hz			
Remar	k:		eport for th	e emission v	vhich more t	han 10 dB t	pelow the	;
00.0 dB	uV/m	_						
						FCC Part15 C	- Above 16 P	ĸ
						FCC Part15 C	- Above 1G A	v
50	1							
	,	\$						
		•						
0.0								
	0 3500.00	6000.00	8500.00 11	000.00 13500.0	0 16000.00 1	8500.00 21000	.00	26000.00 M
0.0	0 3500.00	6000.00	8500.00 11	000.00 13500.0	0 16000.00 1	8500.00 21000	.00	26000.0
No	Frequ	ency	Factor	Reading	Level	Limit	Margin	Detecto
No.	Frequ (Mł		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)		Margin (dB)	Detecto
No. 1		lz)						Detecto peak

EN



nt. Pol.		Hori	zontal					
est Moo	de:	TX E	BLE 2MHz N	/lode 2402N	1Hz			
emark:			eport for the cribed limit.	emission v	hich more t	han 10 dB t	elow the	
0.0 dBu¥	/m	1 1-1-2-2						
						FCC Part15 C	- Above 1G PK	
						500 D 415 C		
50						FCC Part15 C	- Above 16 AV	·
0	2 X							
	*							
.0								
1000.000	3500.00	6000.00	8500.00 110	00.00 13500.00) 16000.00 1	8500.00 21000.	00	26000.00 MH
No.	Freque (MH	-	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	4803		3.11	29.51	32.62	54.00	-21.38	AVG
2	4804	.025	3.11	42.30	45.41	74.00	-28.59	peak
1	(MH 4803	lz) .897	(dB/m) 3.11	(dBuV) 29.51	(dBuV/m) 32.62	(dBuV/m) 54.00	(dB) -21.38	A١

FN



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\ (ol.	Vert	ical					
Test N	lode:	TX I	BLE 2MHz N	/lode 2402N	1Hz			
Rema	rk:		eport for the cribed limit.	e emission v	which more t	han 10 dB b	pelow the	:
100.0 d	BuV/m							
						FCC Part15 C	- Above 1G Pl	<
						FCC Part15 C	- Above 1G A	<u> </u>
50		1 X						
	į	2						
0.0								
	00 3500.00	6000.00	8500.00 11	000.00 13500.0	0 16000.00 1	8500.00 21000.	.00	26000.00 MI
No.		uency Hz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
		4.140	3.11	42.18	45.29	74.00	-28.71	peak
1			3.11	27.95	31.06	54.00	-22.94	AVG



EN.

nt. P	ol.	Hori	zontal					
est N	lode:	TX E	BLE 2MHz N	Mode 2440N	ЛНz			
ema	rk:		eport for the cribed limit.		which more 1	than 10 dB t	pelow the	;
0.0 d	BuV/m	1 10000						
						500 D . 145 O		
-						FCC Part15 C	- ADOVE TU P	<u> </u>
						FCC Part15 C	- Above 1G A	v
50	2							
	Î							
	1							
	Î							
0.0								
1000.0	00 3500.00	6000.00	8500.00 11	000.00 13500.0	0 16000.00 1	18500.00 21000	.00	26000.00 M
	Freque	ency	Factor	Reading	Level	Limit	Margin	
No.	(MH	-	(dB/m)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	Detecto
1	4879.	894	3.33	27.93	31.26	54.00	-22.74	AVG
2	4880.	124	3.33	43.03	46.36	74.00	-27.64	peak



Ant. Pol	-	Verti	cal					
est Mo	de:	TX E	BLE 2MHz N	1ode 2440N	lHz			
Remark	:		eport for the cribed limit.	emission w	hich more t	han 10 dB b	elow the	;
00.0 dBu	√/m							
						FCC Part15 C -	Above 1G P	(
50						FCC Part15 C -	Above 1G A	,
50	2 X							
	*							
0.0	3500.00	6000.00	8500.00 110	00.00 13500.00) 16000.00 1	8500.00 21000.	00	26000.00 MH
No.	Frequ (Mł		Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
1	× .).759	3.33	28.21	31.54	54.00	-22.46	AVG
2	4880	0.033	3.33	41.90	45.23	74.00	-28.77	peak
	•							



	ol.	Hor	izontal					
est N	lode:	TX	BLE 2MHz N	/lode 2480N	1Hz			
Rema	rk:		report for the scribed limit.		vhich more t	han 10 dB t	pelow the	•
00.0 c	lBuV/m							
						FCC Part15 C	- Above 16 P	ĸ
						FCC Part15 C	- Above 1G A	v
50	×							
	X							
0.0	000 3500.00	000.00	8500.00 11	000.00 13500.0	0 16000.00 1	8500.00 21000		26000.00 M
	Freque (MH:	-	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
No.	(45.04	74.00	-28.79	peak
No. 1	4959.		3.57	41.64	45.21	74.00	-20.19	pean.

FN



	. Pol	-		Vert	ical											
Tes	t Mo	de:		TX I	BLE	2MH	z N	1ode	2480	MHz	z					
Ren	nark	:			repor scribe			emis	ssion	whi	ch n	nore t	han 1	0 dB	below the	9
00.0	dBuV	//m		p												
-													FCC	C Part15 C	- Above 1G P	ĸ
													FCC	: Part15 C	- Above 1G A	v
50			1 X													
			X													
0.0																
10	00.000	3500.00	600	0.00	8500	.00	110	00.00	13500	.00	16000	D.OO 1	8500.00	21000).00	26000.00 M
N	lo.	Freq (M	uen Hz)			acto B/m			ading 3u∨)		Le\ Bu [\]	vel V/m)		mit ₄V/m)	Margin (dB)	Detecto
		495	9.91	15		3.57		41	.79		45.	36	74	4.00	-28.64	peak
	1	400	0.0					27				02		1.00	-22.98	AVG

FN



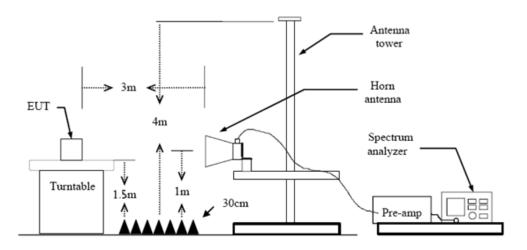
3.3. Band Edge Emissions (Radiated)

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d)/ RSS 247 5.5:

Restricted Frequency Band	(dBuV/n	n)(at 3m)
(MHz)	Peak	Average
2310 ~ 2390	74	54
2483.5 ~ 2500	74	54

Test Configuration



Test Procedure

- 1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
- 2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- 4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- 5. The receiver set as follow:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW see note 1 with Peak Detector for Average Value.

Note 1: For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 3.8 Duty Cycle.

Test Mode

Please refer to the clause 2.4.



Test Results

EN

nt. Po	l	Horiz	zontal					
est Mo	de:	BLE	1MHz Mode	e 2402MHz				
)0.0 dBu	V/m							
0								- A
,						FCC Part15 C	- Above 16 Pl	
						FCC Part15 C	- Above 16 A X	v
							2	
muter		manan and a second	and the second	adamaalaan ahaan ahaalaa ka	Annahansan ang anaka	mennet	an an fair an dhair a	لامىيەن ⊻
ı								
2305.000	2315.00	2325.00	2335.00 234	45.00 (MHz)	2365.00	2375.00 2385.	00 2395.0	0 2405.0
No.	Frequ (Mł		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390	.000	21.41	30.84	52.25	74.00	-21.75	peak
2 *	2390	.000	6.39	30.84	37.23	54.00	-16.77	AVG



nt. Po	I.	Vert	ical					
est Mo	de:	BLE	1MHz Mode	e 2402MHz				
00.0 dBu	V/m							
D								
0						FCC Part15 C	- Above 1G P	K A
0								
D						ECC Davite C	Ald 10 A	<u> </u>
0						FCC Part15 C	- Abbye Tu A	
0			4		1		2	
0	**************	grande franker fan	an a	and and the second s				
D								
D								
0.0	2315.00	2325.00	2335.00 23	45.00 (MHz)	2365.00	2375.00 2385	.00 2395.	00 2405.
No.	Freque (MH	-	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.0		22.34	30.84	53.18	74.00	-20.82	peak
2 *	2390.		5.72	30.84	36.56	54.00	-17.44	AVG
Remark	s:				1	1	1	1



Ant. F	Pol.	Hor	izontal					
est N	Node:	BLE	1MHz Mod	e 2480 MH:	Z			
00.0 d	lBuV/m							
0	٨							
o						FCC Part15 C	- Above 1G P	ĸ
0								
o	Ĵ,					FCC Part15 C	- Above 1G A	v
0								
0	2	warnen ante	a while both and the second	an that a state of a training	and the second and the second	and the second second second	unu Munthalla	MALMAN
0								
o								
0								
0.0 2475.5	500 2485.50	2495.50	2505.50 25	i15.50 (MHz)	2535.50	2545.50 2555.	.50 2565.	50 2575.5
No.		quency /IHz)	Reading (dBu∀)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	248	33.500	22.93	31.24	54.17	74.00	-19.83	peak
	* 248		5.81	31.24	37.05	54.00	-16.95	AVG

Remarks:



Ant	. Pol	I.		V	ertio	cal															
Test	t Mo			В	LE	1MF	Hz N	lode	248	80 M	Hz										
100.0 T) dBu	V/m																			
90																					
80	A														FCC	Part15	С - AI	bove 1G	PK		
70															100	T ditta		5070 10			
60																		10			
50		1 X													FLL	Partis		bove 16	AV		
40		2	ware and		mm	unul	- Maralian		yophand.		sur Mirta	warn	Mun Ma	Maria	hanne	hunary	un man	المدودين والمحار	n	when	
30											-										
20																					
10																					
0.0	76.000	2486		2496.	00	250	6.00	05	6.00	(MH	-		86.00	25	16.00	- 25	56.00	250	<u>56.00</u>	2576	
N	o.		eque (MH:		/		adin 3u∨			ctor 8/m)			vel iV/m) ((nit V/m		1argi (dB)		Detecto	
1		24	483.5	500		20	0.66		31	.24		51	.90		74	.00	-	22.1	0	peak	(
2	*	24	483.5	500		6	.16		31	.24		37	.40		54	.00	-	16.6	0	AVG	
1.Fa		dB	/m) = ue =						B/m)	+Ca	ble	e Fac	tor (c	B)-	Pre	-amj	olifie	er Fac	cto	r	



ht	. Pol	-	Hor	izontal					
es	t Mo	de:	BLE	2MHz Mod	e 2402MHz	Ζ			
00.0	dBu	//m		1					
10									\wedge
0							FCC Part15 C	- Above 1G P	K H
0									
0							FCC Part15 C	- Abpve 1G A	
o								×	
0			O of a literation of	and the second second second with the	an her weet that and her	human managementer	Anharates an abieth	2 martinetal anti-	
0	(L-4)(above-	and a constant of differ	a na na 1864 (na 86a)	ande et alfrede andere de stra et					
0									
0									
0.0	05.000	2315.00	2325.00	2335.00 23	345.00 (MHz)	2365.00	2375.00 2385	.00 2395.	0 2405.
N	o.	Frequ (MF		Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1		2390.	.000	22.05	30.84	52.89	74.00	-21.11	peak
2	*	2390.	.000	7.89	30.84	38.73	54.00	-15.27	AVG
-		2000		1.00	00.04	00.70	01.00	10.21	,

Remarks:

EN.



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Ant. Pol. Test Mode:		Vertical BLE 2MHz Mode 2402MHz						
0								
30						FCC Part15 C	- Above 1G Pl	
70								
io						ECC PostE C	About 1C Al	\mathbb{H}
50						FCC Part15 C	X	
10	autole met deadent	Mahan sun	all & markening of the	Munter when Adams	where have made and the	and an one property and	2	and h
30								
20								
0								
0.0	2315.00 2	325.00	2335.00 23	45.00 (MHz)	2365.00	2375.00 2385.	00 2395.0	0 2405.0
		1						
No.	Frequer (MHz	-	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2390.0	00	20.82	30.84	51.66	74.00	-22.34	peak
2 *	2390.0	00	7.03	30.84	37.87	54.00	-16.13	AVG
)'								
	(dB/m) = /		na Factor (c Limit value	lB/m)+Cabl	e Factor (dB	8)-Pre-ampli	fier Facto	or



FN

۱n	t. P	ol.		Hori	zontal										
Tes	st N	lode:		BLE	2MHz M	lode	2480	MHz	Z						
00.0	o de	3u¥/m													
10															
0											FCC	Part15 C	- Above 1G	PK	
0															
0	\mid										FCC	Part15 C	- Above 1G	۵V	
0	Ħ	X											nooro ra		
0	J	2	www.	Northempor	and and the states	Amaria	whenter	hourse	www.www.	ant when the	while where	section and a section of	www.	women	Andata
0															
0															
0															
0.0	475.50	0 2485.	50	2495.50	2505.50	251	5 50	(MHz)	253	5.50	2545.50	2555.	50 250	5.50	2575.5
		Er.	eque		Readir		Fac	tor		vel	Lir	nit	Marci	n	
Ν	lo.		eque (MH:		(dBu∀		(dB/				(dBu		Margi (dB)		etector
	1	24	483.5	500	21.12		31.2	24	52	.36	74.	.00	-21.6	4 1	beak
2	2 *	24	483.5	500	7.46		31.2	24	38	.70	54.	.00	-15.3	0 /	AVG

Remarks: 1.Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor 2.Margin value = Level -Limit value



nt. Po	Ι.	Vert	ical					
est Mo	de:	BLE	2MHz Mod	e 2480 MHz	2			
00.0 dBu	V/m							
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0.0 2476.000	2486.00	2496.00	2506.00 25	16.00 (MHz)	2536.00 2	2546.00 2556.1	00 2566.0	0 2576.0
No.	Frequ (Mł	-	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2483	.500	19.88	31.24	51.12	74.00	-22.88	peak
2 *	2483	.500	6.89	31.24	38.13	54.00	-15.87	AVG
Remark	s:							
			na Factor (o Limit value	lB/m)+Cabl	e Factor (dB)-Pre-ampli	fier Facto	or

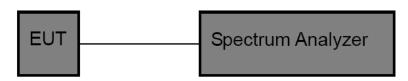


3.4. Band edge and Spurious Emissions (Conducted)

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Test Configuration



Test Procedure

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously
- Use the following spectrum analyzer settings: RBW = 100 kHz, VBW ≥ RBW, scan up through 10th harmonic.
- Sweep = auto, Detector function = peak, Trace = max hold
- 4. Measure and record the results in the test report.

Test Mode

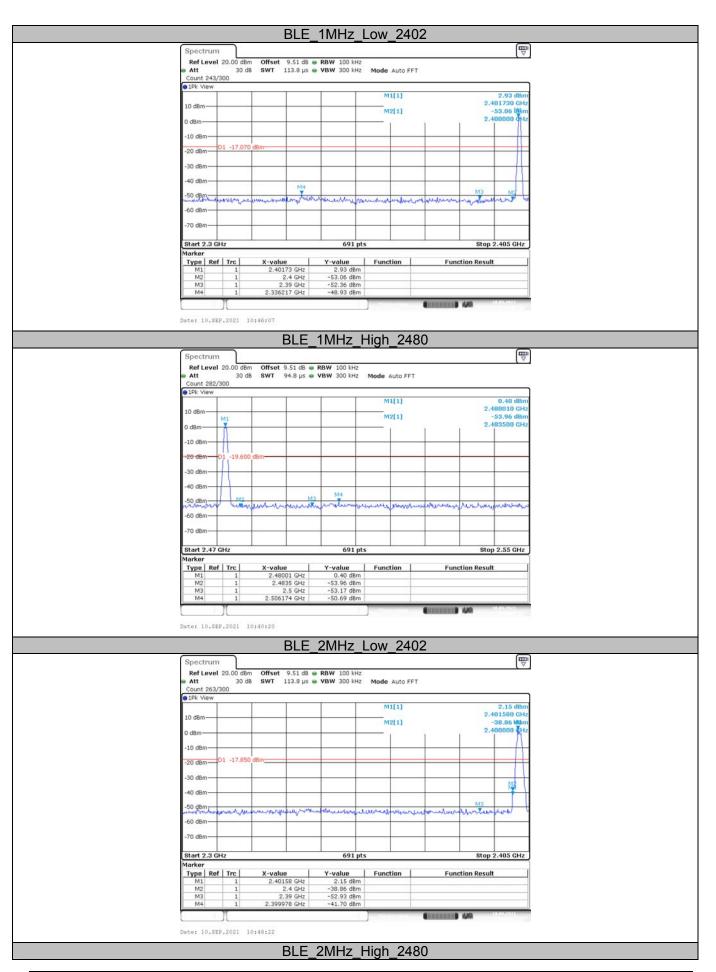
Please refer to the clause 2.4.

Test Results

(1) Band edge Conducted Test

Test Mode	Frequency[MHz]	Ref Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
	2402	2.93	-48.93	<=-17.07	PASS
BLE 1MHz	2480	0.40	-50.69	<=-19.60	PASS
BLE 2MHz	2402	2.15	-41.7	<=-17.85	PASS
	2480	-4.11	-51.72	<=-24.11	PASS







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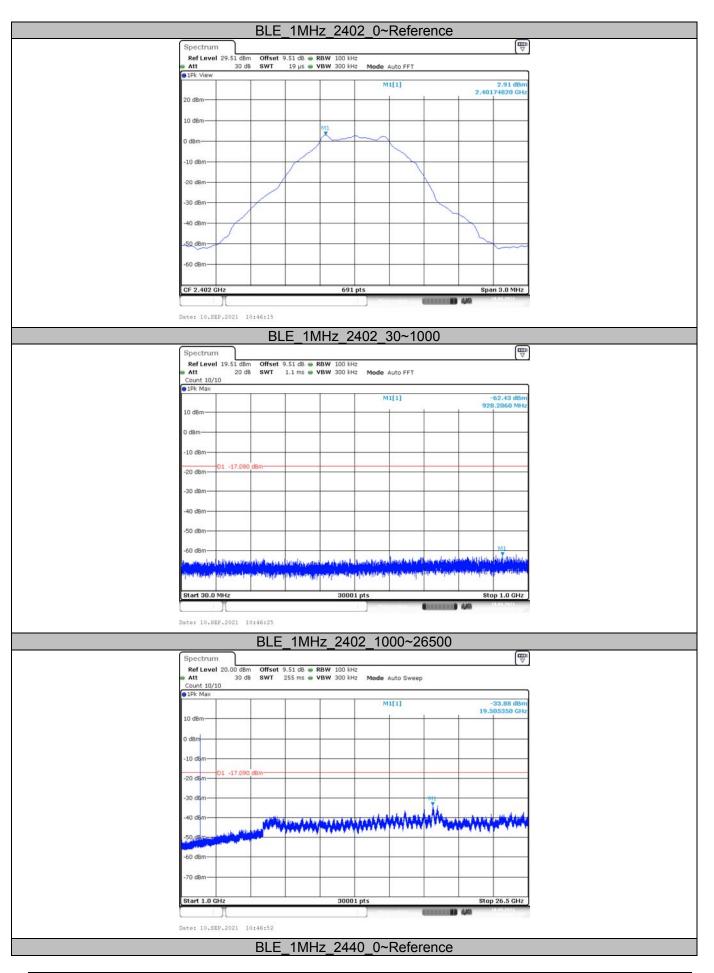


Ref Le	vel 2	0.00 dBr	n Offset	9.51 dB 🖷	RBW 100 kHz					
Att			B SWT	94.8 µs 🖷	VBW 300 kHz	Mode Au	to FFT			
Count 2)								
1Pk Vie	w									
						M1[1]			-4.11 dBm 179550 GHz
10 dBm-	-					M2[1]			-55.00 dBm
0 dBm-	141				-				2.4	183500 GHz
10000000	T ₀									
-10 dBm-	1		-		+ +			-		
-20 dBm-	1									
-Lo dom		-24.110	dBm							
-30 dBm-	-11		1		+ +					
-40 dBm-										
51.075.070750As	P	2			M4					
-50 dBm		112	tore direct of	M.	reportion	and the second second	and the	and a set failer	11.000	and the
-60 dBm-		the state	hundred	- Charles	and the second		and the state of t	Arrestand	June Acres	and and the
00 00										
-70 dBm-	-		-							<u> </u>
Start 2.	47 GH	z	and 0		691 pt	5			Stop	2.55 GHz
Marker	1									
Type M1	Ref	1	X-value	55 GHz	-4.11 dBm	Functio	n	Func	tion Result	t
M2	-	1		35 GHz	-55.00 dBm	-				
M3		1	2	.5 GHz	-53.84 dBm					3
M4		1	2.5060	58 GHz	-51.72 dBm	1				
C	1							()	440	99.00.7971



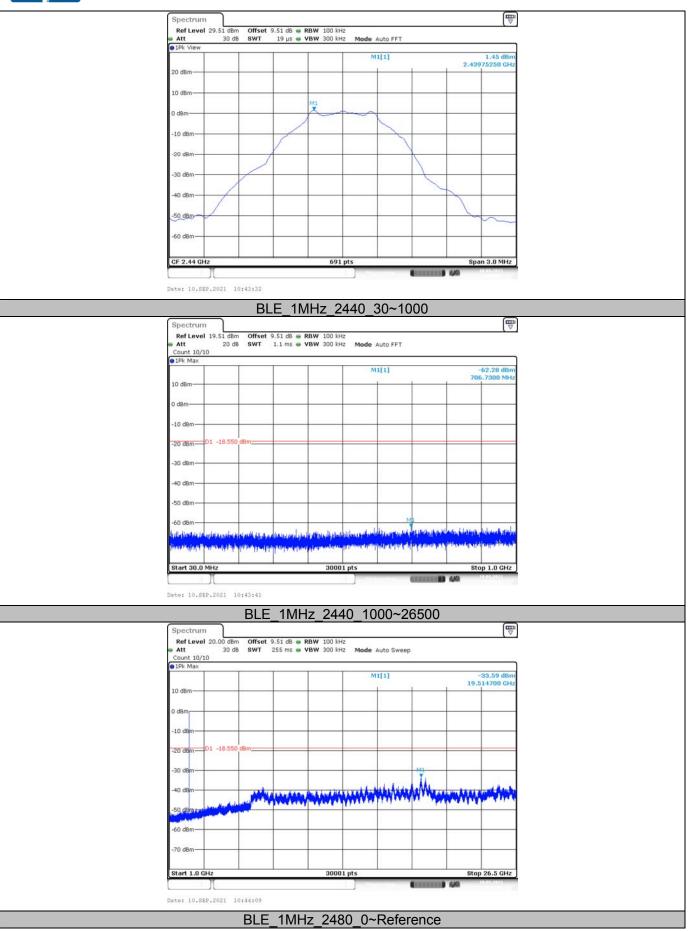
(2) Conducted Spurious Emissions Test

Test Mode	Frequency [MHz]	Freq Range [MHz]	Ref Level [dBm]	Result[dBm]	Limit[dBm]	Verdict
		Reference	2.91	2.91		PASS
	2402	30~1000	30~1000	-62.43	<=-17.09	PASS
		1000~26500	1000~26500	-33.88	<=-17.09	PASS
		Reference	1.45	1.45		PASS
BLE 1MHz	2440	30~1000	30~1000	-62.28	<=-18.55	PASS
		1000~26500	1000~26500	-33.59	<=-18.55	PASS
		Reference	0.89	0.89		PASS
	2480	30~1000	30~1000	-61.97	<=-19.11	PASS
		1000~26500	1000~26500	-34.80	<=-19.11	PASS
		Reference	2.40	2.40		PASS
	2402	30~1000	30~1000	-62.30	<=-17.60	PASS
		1000~26500	1000~26500	-29.31	<=-17.60	PASS
		Reference	1.61	1.61		PASS
BLE 2MHz	2440	30~1000	30~1000	-62.21	<=-18.39	PASS
		1000~26500	1000~26500	-34.25	<=-18.39	PASS
		Reference	1.59	1.59		PASS
	2480	30~1000	30~1000	-62.38	<=-18.41	PASS
		1000~26500	1000~26500	-34.02	<=-18.41	PASS



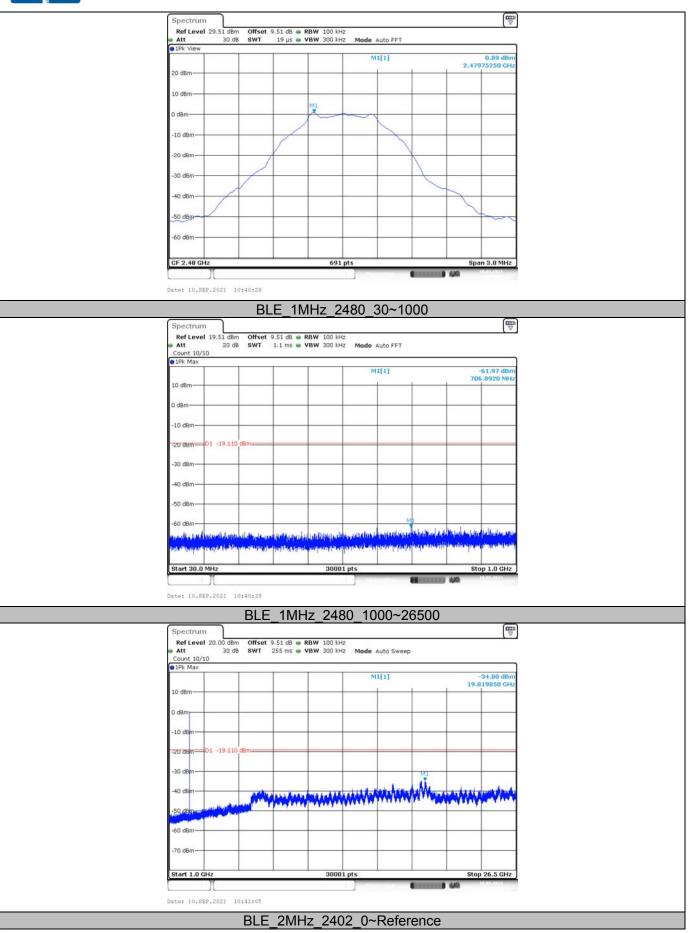






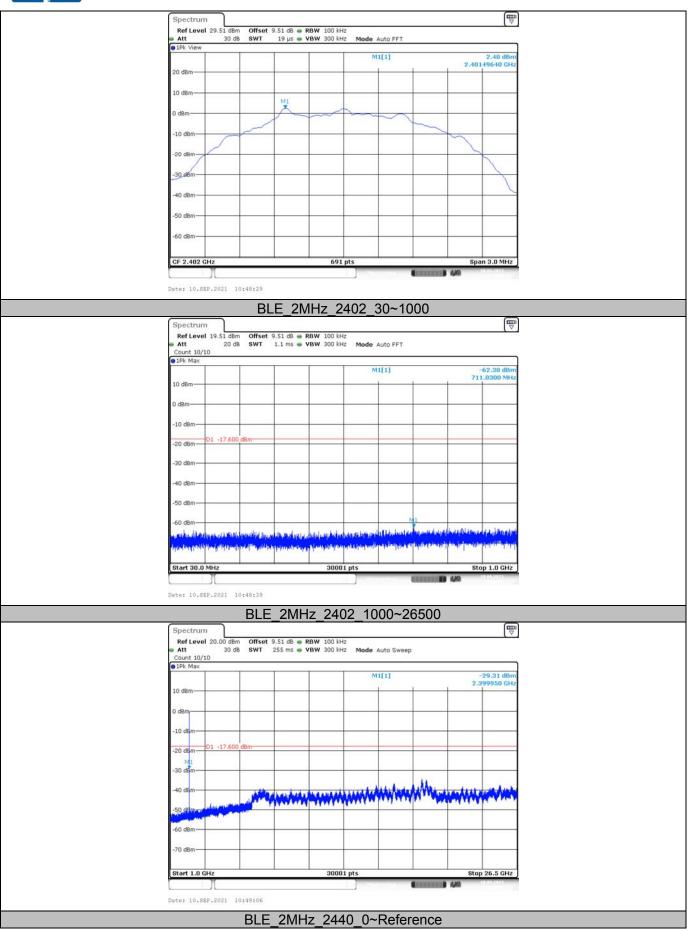
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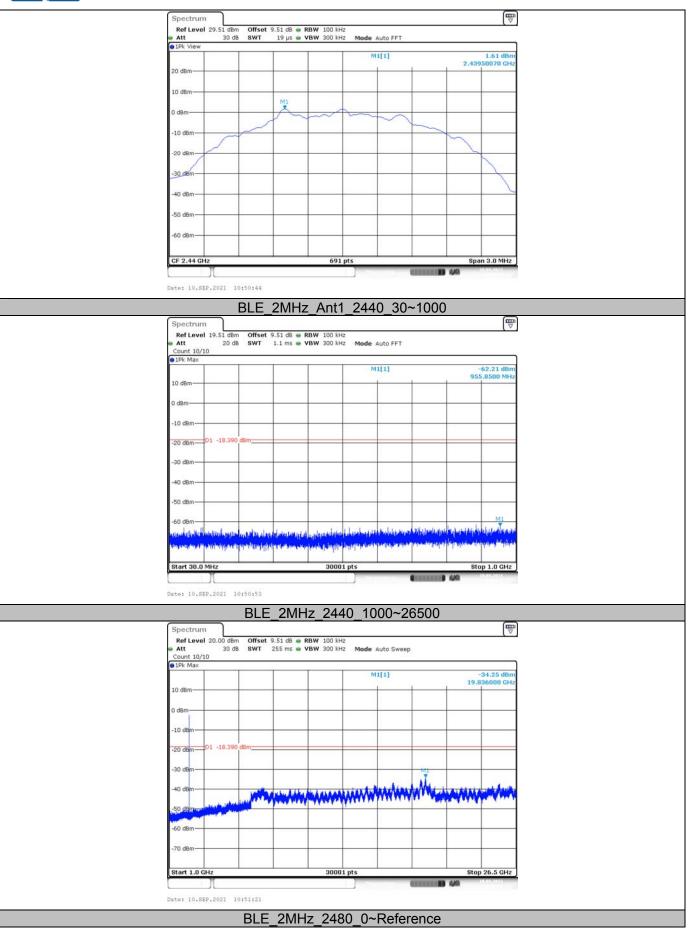






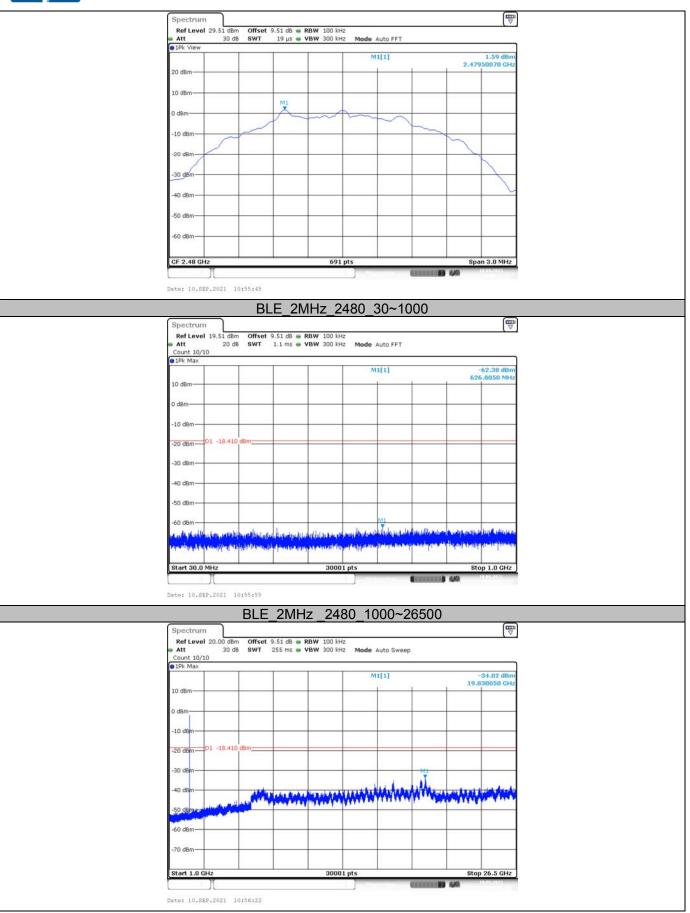














3.5. DTS Bandwidth

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2)/ RSS-247 5.2 a:

Test Item	Limit	Frequency Range(MHz)
DTS Bandwidth	>=500 KHz (6dB bandwidth)	2400~2483.5

Test Configuration

EUT	Spectrum Analyzer

Test Procedure

- 5. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 6. DTS Spectrum Setting:
 - (1) Set RBW = 100 kHz.
 - (2) Set the video bandwidth (VBW) \geq 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.
 - OCB Spectrum Setting:
 - (1) Set RBW = $1\% \sim 5\%$ occupied bandwidth.
 - (2) Set the video bandwidth (VBW) \ge 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

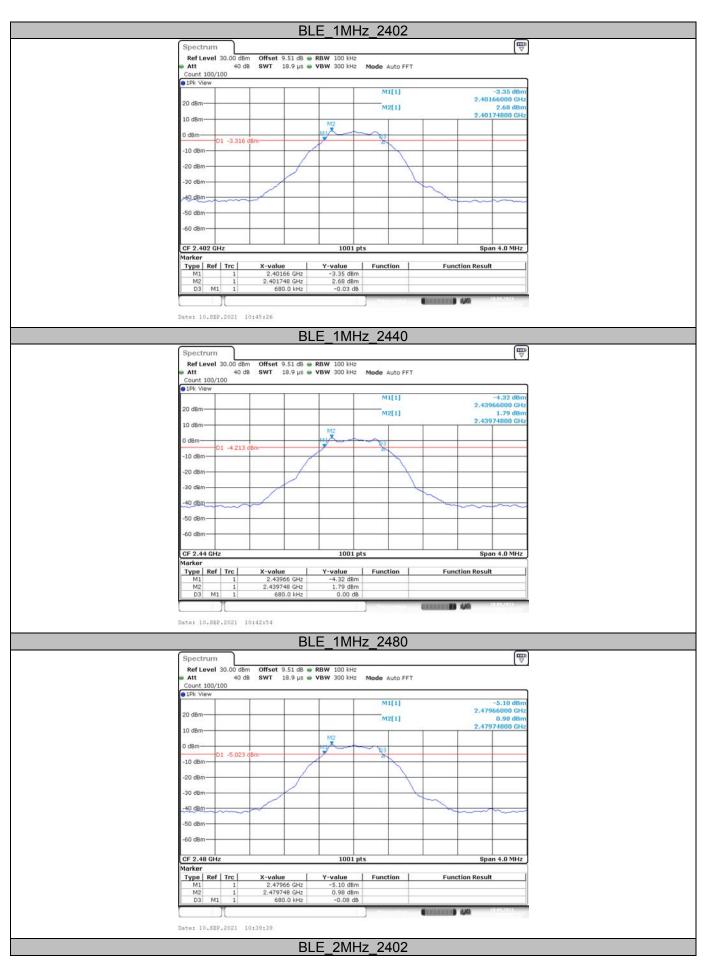
Test Mode

Please refer to the clause 2.4.

Test Results

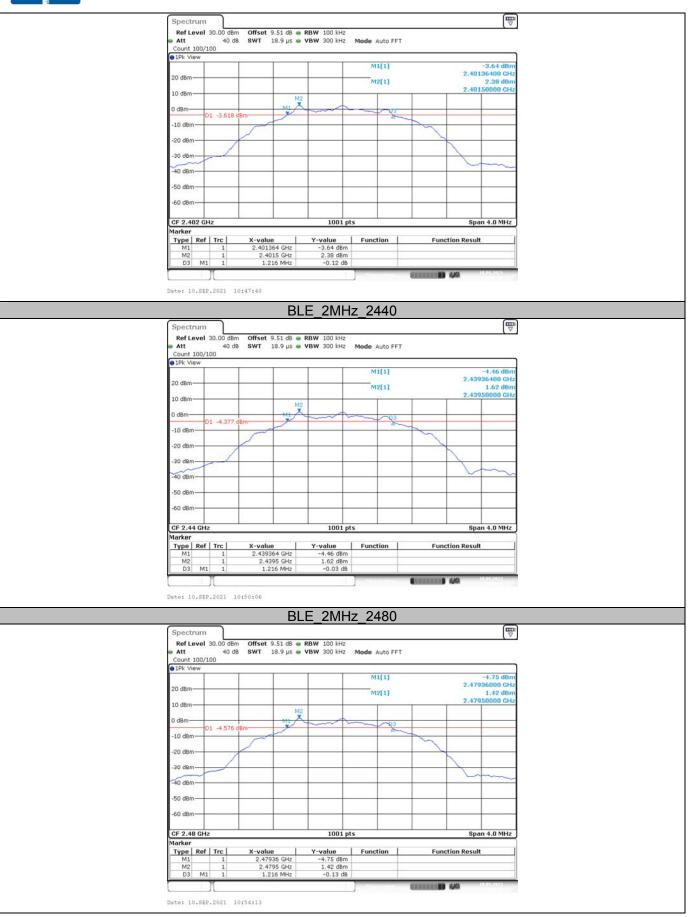
Test Mode	Frequency[MHz]	DTS BW[MHz]	Limit[MHz]	Verdict
	2402	0.680	>=0.5	PASS
BLE 1MHz	2440	0.680	>=0.5	PASS
	2480	0.680	>=0.5	PASS
	2402	1.216	>=0.5	PASS
BLE 2MHz	2440	1.216	>=0.5	PASS
	2480	1.216	>=0.5	PASS











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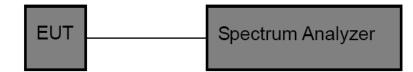
3.6. Peak Output Power

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3)/ RSS-247 5.4 d:

Section	Test Item	Limit	Frequency Range(MHz)
CFR 47 FCC 15.247(b)(3)	Maximum conducted output power	1 Watt or 30dBm	2400~2483.5
ISED RSS-247 5.4 d	EIRP	4 Watt or 36dBm	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.

2. Spectrum Setting:

Peak Detector: RBW≥DTS Bandwidth, VBW≥3*RBW. Sweep time=Auto. Detector= Peak. Trace mode= Maxhold.

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

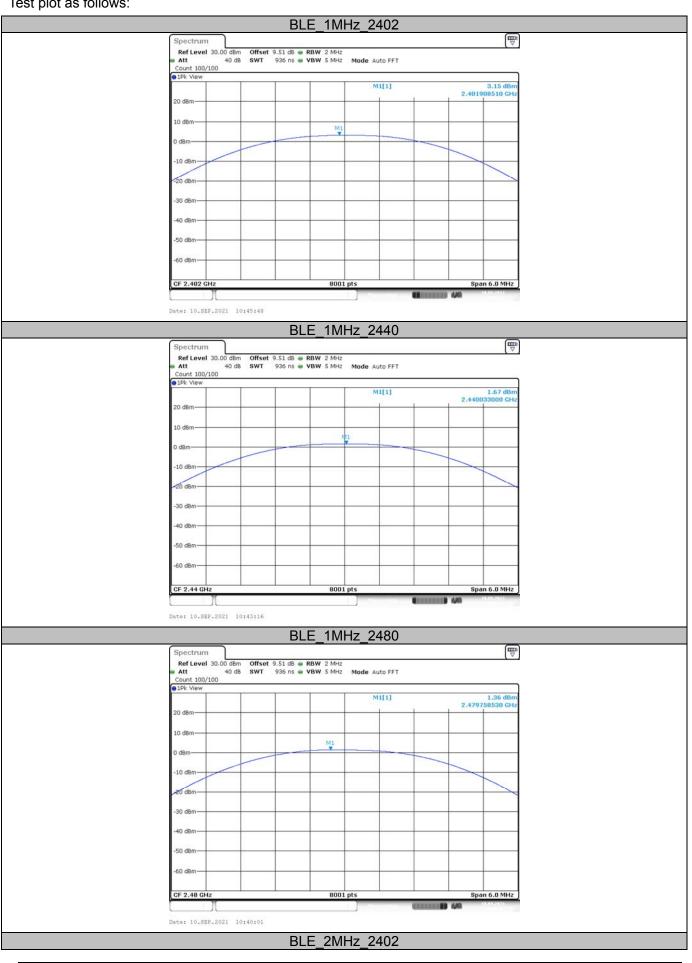
Test Mode

Please refer to the clause 2.4.

Test Result

Test Mode	Frequency[MHz]	Result[dBm]	Limit[dBm]	Verdict
	2402	3.15	<=30	PASS
BLE 1MHz	2440	1.67	<=30	PASS
	2480	1.36	<=30	PASS
	2402	3.25	<=30	PASS
BLE 2MHz	2440	2.45	<=30	PASS
	2480	0.75	<=30	PASS

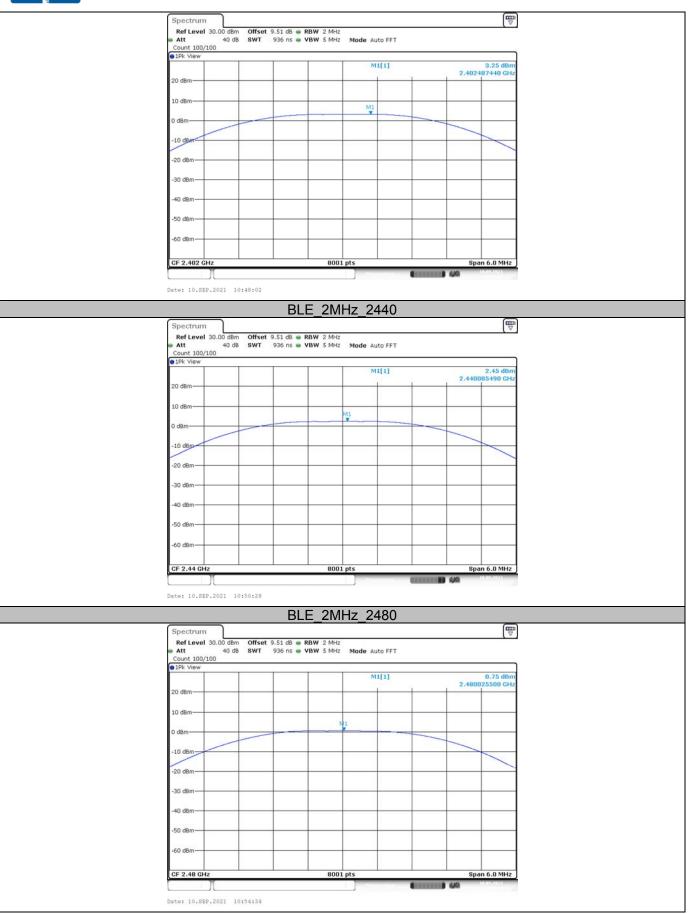






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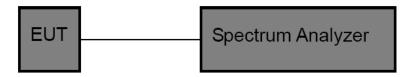
3.7. Power Spectral Density

<u>Limit</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e)/ RSS-247 5.2 b:

Test Item	Limit	Frequency Range(MHz)
Power Spectral Density	8dBm(in any 3 kHz)	2400~2483.5

Test Configuration



Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.

3. Spectrum Setting:

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth.

Set the RBW to: 3 kHz

Set the VBW to: 10 kHz

Detector: peak

Sweep time: auto

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

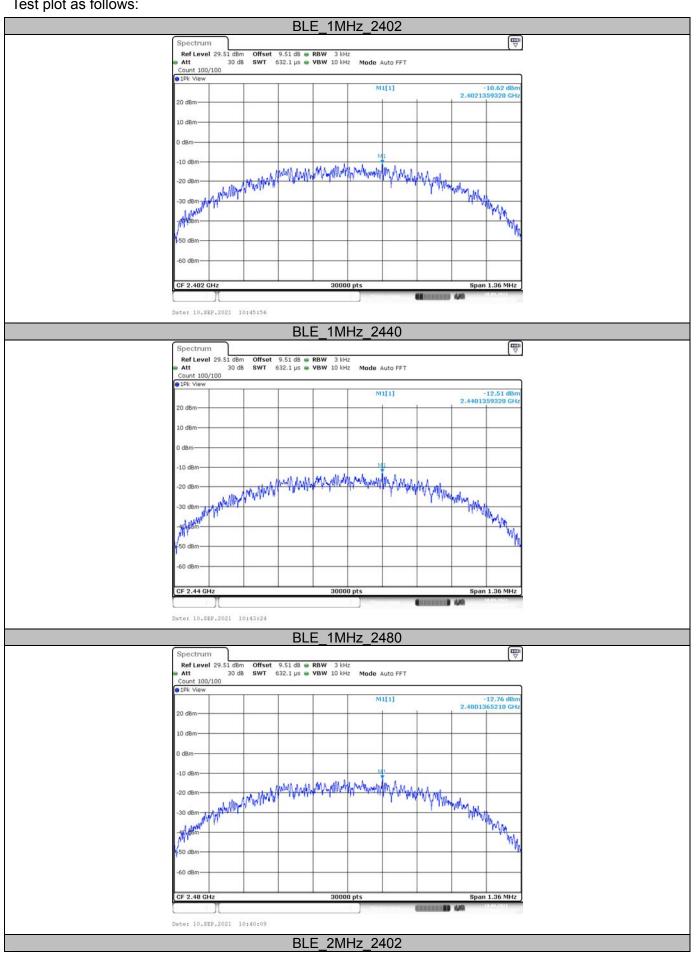
Test Mode

Please refer to the clause 2.4.

Test Result

Test Mode	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
	2402	-10.62	<=8	PASS
BLE 1MHz	2440	-12.51	<=8	PASS
	2480	-12.76	<=8	PASS
	2402	-13.18	<=8	PASS
BLE 2MHz	2440	-14.10	<=8	PASS
	2480	-15.23	<=8	PASS



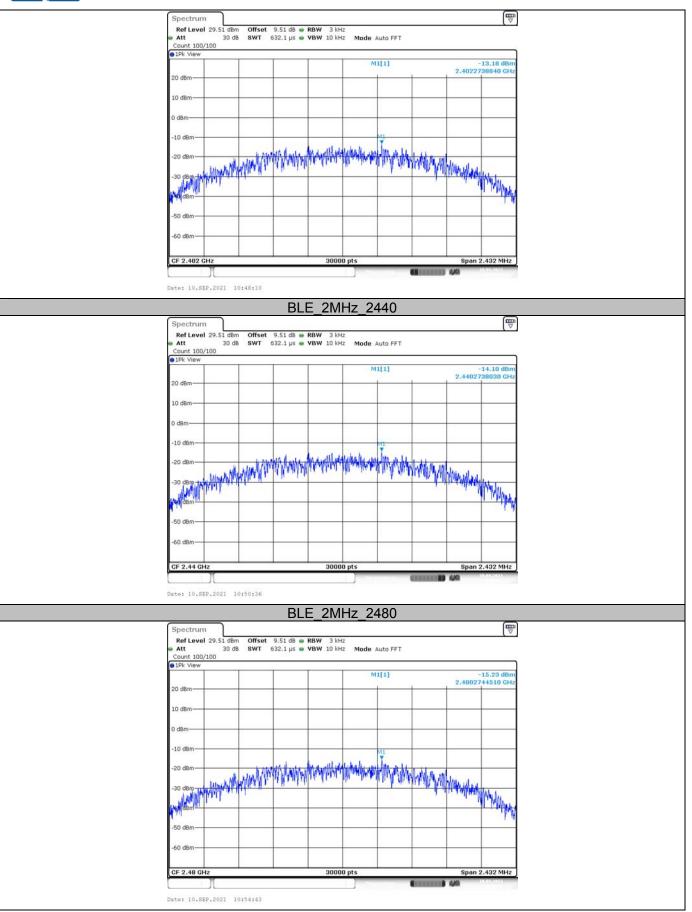




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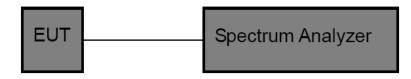


3.8. Duty Cycle

<u>Limit</u>

None, for report purposes only.

Test Configuration



Test Procedure

- 1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- 2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.

3. Spectrum Setting: Set analyzer center frequency to test channel center frequency. Set the span to 0Hz Set the RBW to 8MHz Set the VBW to 8MHz Detector: Peak Sweep time: Auto

Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

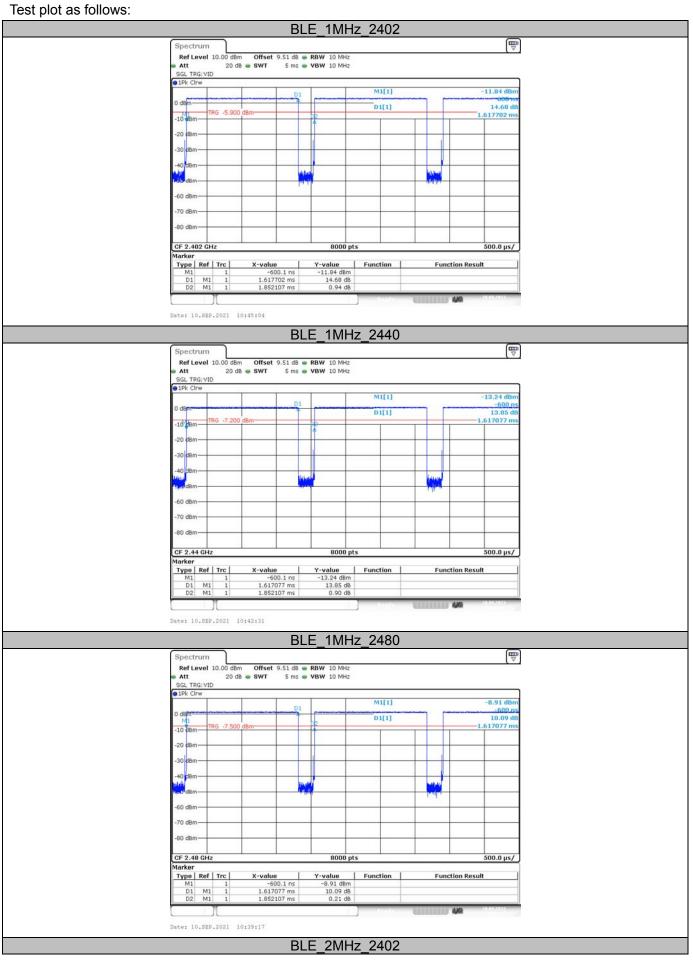
Test Mode

Please refer to the clause 2.4.

<u>Test Result</u>

Test Mode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T Minimum VBW (kHz)	Final setting For VBW (kHz)
BLE 1MHz	2402	1.62	1.85	87.34	0.62	1
	2440	1.62	1.85	87.31	0.62	1
	2480	1.62	1.85	87.31	0.62	1
BLE 2MHz	2402	0.81	1.23	65.87	1.23	2
	2440	0.81	1.23	65.87	1.23	2
	2480	0.81	1.24	65.84	1.23	2







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3.9. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.